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EXAMINER	
PEREZ, JAMES M	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/522,689	PALIN ET AL.	
	Examiner	Art Unit	
	James M. Perez	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :1/16/2008 and 11/20/2007 and 08/21/2007.

Detailed Action

Response to Arguments

1. Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection as necessitated by applicant's amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 24 recites a plurality of receivers and at least one receiver. This is a contradiction since the presence of only one receiver is included and excluded by the limitations of claim 24. The examiner will interpret claim 24 to have at least one receiver.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 15, 19-21, 24, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki Sudo (USPN 6,950,474) in view of Sipola (US 2002/0044612).

With regards to claims 1 and 15, Hiroaki teaches a method and apparatus comprising:

communicating digital data using an orthogonal frequency division multiplexing (OFDM) transmission system (figs. 1 and 4: col. 1, lines 12-29);

selecting a mode of operation in a transmitter among at least one mode (col. 1, lines 30-56), wherein each mode of operation being associated with a number of active carriers for payload data transmission (fig. 2: col. 4, lines 25-67);

selecting a symbol interleaver (fig. 4: element 102-104: col. 3, line 54 through col. 4, lies 26) in the transmitter from a set (fig. 4: elements 102-103) of symbol interleavers for symbol interleaving in said selected mode of operation (fig. 1: element 102-104: col. 3, line 54 through col. 4, lines 26), wherein the first interleaver is used for a first transmission of a signal using a first set of rules, and the second interleaver is used for re-transmission of a signal after an error using a second set of rules (col. 1, lines 12-30 and col. 3, lines 54 through col. 4, line 56).

applying the selected symbol interleaver in the transmitter on blocks of data units (fig. 4: elements 103-104: col. 1, lines 40-56); and

mapping the interleaved data units onto the active carriers of said selected mode of operation (fig. 1: element 105: col. 1, lines 40-56);

Hiroaki does not explicitly teach the selection of the symbol interleaver is based on a desired depth of interleaving;

Sipola teaches the quality of the transmission path substantially affects the choice of the interleaving depth, wherein more noise channels need to be more random (increased interleaving depth) (paragraphs 37-39). One skilled in the art would have clearly recognized that since the signal re-transmission (first interleaving) method of Hiroaki would obviously have an increased interleaving depth over the first interleaving method, since the an increased interleaving depth (a more random signal) would have a better probability of meeting the transmission signal quality requirements of the receiver (paragraphs 37-39). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the communication method and system of Hiroaki with the improved method of interleaving of Sipola in order to increase the success of a data transmission in a wireless network through a noisy channel (Sipola: paragraph 39).

With regards to claims 19 and 24, Hiroaki teaches a system and apparatus comprising:

communicating digital data using an orthogonal frequency division multiplexing (OFDM) transmission system (figs. 1 and 4: col. 1, lines 12-29), including at least one transmitter and receiver (col. 1, lines 12-29);

a mode selector (fig. 4: elements 101, 104, and 110: col. 1, lines 30-56) for selecting the mode of operation in a transmitter among at least one mode (col. 1, lines 30-56; and col. 4, lines 14-25), wherein each mode of operation being associated with a number of active carriers for payload data transmission (fig. 2: col. 4, lines 25-67);

a symbol interleaver selector for selecting a symbol interleaver (fig. 4: element 102-104: col. 3, line 54 through col. 4, lies 26) in the transmitter from a set (fig. 4: elements 102-103) of symbol interleavers for symbol interleaving in said selected mode of operation (fig. 1: element 102-104: col. 3, line 54 through col. 4, lines 26), wherein the first interleaver is used for a first transmission of a signal using a first set of rules, and the second interleaver is used for re-transmission of a signal after an error using a second set of rules (col. 1, lines 12-30 and col. 3, lines 54 through col. 4, line 56).

an inner interleaver means in the transmitter for applying symbol interleaving on blocks of data units (fig. 1: element 102-104: col. 3, line 54 through col. 4, lines 26);

mapping the interleaved data units onto the active carriers of said selected mode of operation (fig. 1: element 105: col. 1, lines 40-56);

the at least one receiver having a set of symbol de-interleavers for de-interleaving the interleaved data units at the receiver (col. 5, lines 35-65).

a control block means in said at least one receiver configured for recognizing the symbol interleaver used in the data transmission (fig. 4: element 101-104: col. 5, lines 38-65); and

the control block means in said at least one receiver further configured for selecting a symbol de-interleaver from a set of symbol de-interleavers corresponding to the recognized symbol interleaver (fig. 4: element 101-104: col. 5, lines 38-65).

Hiroaki does not explicitly teach the selection of the symbol interleaver is based on a desired depth of interleaving;

Sipola teaches the quality of the transmission path substantially affects the

choice of the interleaving depth, wherein more noise channels need to be more random (increased interleaving depth) (paragraphs 37-39). One skilled in the art would have clearly recognized that since the signal re-transmission (first interleaving) method of Hiroaki would obviously have an increased interleaving depth over the first interleaving method, since the an increased interleaving depth (a more random signal) would have a better probability of meeting the transmission signal quality requirements of the receiver (paragraphs 37-39). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the communication method and system of Hiroaki with the improved method of interleaving of Sipola in order to increase the success of a data transmission in a wireless network through a noisy channel (Sipola: paragraph 39).

With regards to claim 20, Hiroaki in view of Sipola teaches the limitations of claim 19.

Hiroaki further teaches the receiver selecting the correct mode to code and de-interleave the received signal (col. 5, lines 1-60).

Hiroaki does not explicitly teach the receiver is arranged to receive information indicative of the used symbol interleaver.

Sipola teaches the receiver is arranged to receive information indicative of the used symbol interleaver (paragraph 41).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the communication method and system of Hiroaki with the improved method of interleaving of Sipola in order to increase the success of a data transmission in a wireless network through a noisy channel (Sipola: paragraph 39).

With regards to claim 21, Hiroaki in view of Sipola teaches the limitations of claim 19.

Hiroaki further teaches an output from the control block configured for recognizing the symbol interleaver used in the data transmission (col. 5, lines 1-60).

Hiroaki does note explicitly teach information indicative of the recognized symbol interleaver.

Sipola teaches the receiver is arranged to receive information indicative of the used symbol interleaver (paragraph 41).

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the communication method and system of Hiroaki with the improved method of interleaving of Sipola in order to increase the success of a data transmission in a wireless network through a noisy channel (Sipola: paragraph 39).

With regards to claim 27, Hiroaki in view of Sipola teaches the limitations of claim 24.

Hiroaki further teaches the number of symbol interleavers in the set of symbol interleavers is smaller than the number of the modes of operation of the system (fig. 1: elements 102-103: paragraph 35: note that in the situation where no symbol interleavers but some other type of interleaver is used for both elements 102-103, the disclosed invention would have at least one mode of operation and would not have any symbol interleavers).

6. Claims 2-8, 10-14, 16, 25-26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki Sudo (USPN 6,950,474) in view of Sipola (US 2002/0044612), and further in view of Applicant's Admitted Prior Art.

With regards to claim 2, Hiroaki in view of Sipola teaches the method according to claim 1.

Hiroaki does not explicitly teach the number of data units (paragraph 7: note that a data word is a group of multiple bits, therefore a data word is a data unit) in the block (paragraph 7: group) onto which the symbol interleaving is applied differs from the number of the active carriers in said selected mode (paragraph 7: In 2K mode the number of data units is 126, and the disclosed number of active carriers is 1512; similar math can be done for 8K mode).

Applicant's Admitted Prior Art teaches the number of data units (paragraph 7: note that a data word is a group of multiple bits, therefore a data word is a data unit) in the block (paragraph 7: group) onto which the symbol interleaving is applied differs from the number of the active carriers in said selected mode (paragraph 7: In 2K mode the number of data units is 126, and the disclosed number of active carriers is 1512; similar math can be done for 8K mode).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel

which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 3, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 2.

Hiroaki does not explicitly teach the number of data units in the block and the number of active carriers in said selected mode are integer multiples of each other.

Applicant's Admitted Prior Art teaches the number of data units (paragraph 7: data words) in the block (paragraph 7: group) and the number of active carriers in said selected mode are integer multiples of each other (paragraph 7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 4, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 3.

Hiroaki does not explicitly teach Art the number of data units in the block and the number of active carriers in said selected mode are even integer multiples of each other.

Applicant's Admitted Prior Art the number of data units in the block and the number of active carriers in said selected mode are even integer multiples of each other (paragraph 7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 5, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 2.

Hiroaki does not explicitly teach the number of data units in the block is larger than the number of active carriers.

Applicant's Admitted Prior Art teaches the number of data units in the block is larger than the number of active carriers (paragraph 7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 6, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 5.

Hiroaki does not explicitly teach the number of data units in the block is two or a multiple of two times the number of active carriers.

Applicant's Admitted Prior Art teaches the number of data units in the block is two or a multiple of two times the number of active carriers (paragraph 7: note that in 2K mode, the a data word holds at least 2 bits, and since a bit is also a data unit, because it is an entity which holds data, the number of possible data unit bits is at least twice that of the number of active carriers).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 7, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 2.

Hiroaki does not explicitly teach the number of data units in the block is smaller than the number of active carriers.

Applicant's Admitted Prior Art teaches the number of data units in the block is smaller than the number of active carriers (paragraph 7: note that in 2K mode, the number of data words, which is a type of data unit, is smaller than the number of active carriers).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 8, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 7.

Hiroaki does not explicitly teach the number of active carriers is two or a multiple of two times the number of data units in the block.

Applicant's Admitted Prior Art teaches the number of active carriers is two or a multiple of two times the number of data units in the block (paragraph 7).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel

which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 10, Hiroaki in view of Sipola teaches the method according to claim 1.

Hiroaki does not explicitly teach the set of symbol interleavers comprises at least an 8K mode symbol interleaver and a 2K mode symbol interleaver and at least a 4K mode of operation is selectable for a DVB-T (Digital Video Broadcasting-Terrestrial) system.

Applicant's Admitted Prior Art teaches the set of symbol interleavers comprises at least an 8K mode symbol interleaver (**paragraphs 6-7**) and a 2K mode symbol interleaver (**paragraphs 6-7**) and at least a 4K mode of operation (**paragraphs 8-9**) is selectable for a DVB-T (Digital Video Broadcasting-Terrestrial) system (**paragraphs 6-9**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 11, Hiroaki in view of Sipola teaches the method according to claim 1.

Hiroaki does not explicitly teach the set of symbol interleavers comprises at least an 8K mode symbol interleaver and at least a 2K mode of operation is selectable for a DVB-T system.

Applicant's Admitted Prior Art teaches the set of symbol interleavers comprises at least an 8K mode symbol interleaver and at least a 2K mode of operation is selectable for a DVB-T system (**paragraphs 6-7**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 12, Hiroaki in view of Sipola teaches the method according to claim 1.

Hiroaki does not explicitly teach the data units are data units of one or more OFDM-symbols.

Applicant's Admitted Prior Art teaches the data units are data units of one or more OFDM-symbols (**paragraph 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 13, Hiroaki in view of Sipola teaches the method according to claim 1.

Hiroaki does not explicitly teach the digital data communication system is one of the following: a DVB-T (Digital Video Broadcasting-Terrestrial) system, an ISDB-T (Integrated Services Digital Broadcasting-Terrestrial) system.

Applicant's Admitted Prior Art teaches the digital data communication system is one of the following: a DVB-T (Digital Video Broadcasting-Terrestrial) system (**paragraphs 2 and 6**), an ISDB-T (Integrated Services Digital Broadcasting-Terrestrial) system.

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 14, Hiroaki in view of Sipola in further view of Applicant's Admitted Prior Art teaches the method according to claim 2.

Hiroaki does not explicitly teach the data units form part of one of the following: a broadband digital television transmission, a datacasting transmission.

Applicant's Admitted Prior Art teaches the data units form part of one of the following: a broadband digital television transmission (**paragraphs 2 and 6**), a datacasting transmission (**paragraphs 2 and 6**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 16, Hiroaki in view of Sipola teaches the limitations of claim 15.

Hiroaki does not explicitly teach said set of symbol interleavers form part of an inner interleaver of the transmitter.

Applicant's Admitted Prior Art teaches said set of symbol interleavers form part of an inner interleaver of the transmitter (**paragraph 5**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted

Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 25, Hiroaki in view of Sipola teaches the limitations of claim 24.

Hiroaki does not explicitly teach the ratio between the number of the active carriers in the different modes of operation is an integer number.

Applicant's Admitted Prior Art teaches the ratio between the number of the active carriers in the different modes of operation is an integer number (paragraphs 6-7: the ratio of active carriers between 8K (6048) and 2K (1512) modes of operation is 4).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 26, Hiroaki in view of Sipola teaches the limitations of claim 24.

Hiroaki does not explicitly teach the ratio between the number of the active carriers in the different modes of operation is two or a multiple of two.

Applicant's Admitted Prior Art teaches the ratio between the number of the active carriers in the different modes of operation is two or a multiple of two (paragraphs 6-7: the ratio of active carrier between 8K (6048) and 2K (1512) modes of operation is 4).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

With regards to claim 28, Hiroaki teaches a method comprising:

communicating digital data using an orthogonal frequency division multiplexing (OFDM) transmission system (figs. 1 and 4: col. 1, lines 12-29), including at least one transmitter and receiver (col. 1, lines 12-29);

a mode selector (fig. 4: elements 101, 104, and 110: col. 1, lines 30-56) for selecting the mode of operation in a transmitter among at least one mode (col. 1, lines 30-56; and col. 4, lines 14-25), wherein each mode of operation being associated with a number of active carriers for payload data transmission (fig. 2: col. 4, lines 25-67);

a symbol interleaver selector for selecting a symbol interleaver (fig. 4: element 102-104: col. 3, line 54 through col. 4, lies 26) in the transmitter from a set (fig. 4: elements 102-103) of symbol interleavers for symbol interleaving in said selected mode of operation (fig. 1: element 102-104: col. 3, line 54 through col. 4, lines 26), wherein the

first interleaver is used for a first transmission of a signal using a first set of rules, and the second interleaver is used for re-transmission of a signal after an error using a second set of rules (col. 1, lines 12-30 and col. 3, lines 54 through col. 4, line 56).

an inner interleaver means in the transmitter for applying symbol interleaving on blocks of data units (fig. 1: element 102-104: col. 3, line 54 through col. 4, lines 26);

mapping the interleaved data units onto the active carriers of said selected mode of operation (fig. 1: element 105: col. 1, lines 40-56);

the at least one receiver having a set of symbol de-interleavers for de-interleaving the interleaved data units at the receiver (col. 5, lines 35-65).

a control block means in said at least one receiver configured for recognizing the symbol interleaver used in the data transmission (fig. 4: element 101-104: col. 5, lines 38-65); and

the control block means in said at least one receiver further configured for selecting a symbol de-interleaver from a set of symbol de-interleavers corresponding to the recognized symbol interleaver (fig. 4: element 101-104: col. 5, lines 38-65).

Limitation 1)

Hiroaki does not explicitly teach two limitations: Limitation 1) the selection of the symbol interleaver is based on a desired depth of interleaving; and Limitation 2) a plurality of receivers.

Sipola teaches the quality of the transmission path substantially affects the choice of the interleaving depth, wherein more noise channels need to be more random (increased interleaving depth) (paragraphs 37-39). One skilled in the art would have

clearly recognized that since the signal re-transmission (first interleaving) method of Hiroaki would obviously have an increased interleaving depth over the first interleaving method, since the an increased interleaving depth (a more random signal) would have a better probability of meeting the transmission signal quality requirements of the receiver (paragraphs 37-39). Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the communication method and system of Hiroaki with the improved method of interleaving of Sipola in order to increase the success of a data transmission in a wireless network through a noisy channel (Sipola: paragraph 39). Limitation 2)

Applicant's Admitted Prior Art teaches a plurality of receivers (paragraph 2: plurality of DVB-T receivers).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki with the teachings of the Applicant's Admitted Prior Art in order to provide an Orthogonal frequency division multiplexing transition and receiving system for more effectively transmitting high rate digital data across a channel which suffers from random burst noise conditions, multi-path conditions, and sub-carrier attenuation.

7. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki Sudo (USPN 6,950,474) in view of Sipola (US 2002/0044612, and further in view of ETSI EN 300 744 V1.4.1 (2001-01).

With regards to claims 17-18, Hiroaki in view of the Sipola teaches the transmitter according to claim 15.

Hiroaki teaches the receiver selecting the correct mode to code and de-interleave the received signal (col. 5, lines 1-60).

Hiroaki does not explicitly teach a transmission system wherein the transmitter is arranged to transmit information indicative of said selected symbol interleaver to an OFDM receiver, wherein one or more TPS (Transmission Parameter Signaling) bits are arranged to convey said information indicative of said selected symbol interleaver.

ETSI EN 300 744 V1.4.1 teaches a transmission system wherein the transmitter is arranged to transmit information indicative of said selected symbol interleaver to an OFDM receiver. See pages 30-32, table 9 and 15: TPS (Transmission Parameter Signaling) bits inherently disclose bit which indicate the operating mode of the transmitter, including modulation and coding. One of ordinary skill in the art would clearly understand that it would be obvious to modify the signal information bits (ETSI EN 300 744 V1.4.1: page 30) of the preamble in order to let the receiver know the correct decoding (including interleaving) and demodulation methods to derive the original data without adding de-coding error.

Therefore it would be obvious to one of ordinary skill in the art at the time of the invention to modify the system of Hiroaki in order to use the control information bits of ETSI EN 300 744 V1.4.1 in order to have the receiver correctly derive the original data without adding de-coding error and also have the wireless system compatible with a

major standard in the global community, thereby increasing marketability and profitability.

8. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroaki Sudo (USPN 6,950,474) in view of Sipola (US 2002/0044612), and further in view of Hosur (US 2001/0033623).

With regards to claim 22, Hiroaki in view of the Sipola teaches a receiver according to claim 19. Hiroaki does not explicitly teach a receiver which is one of the following: a fixed receiver, a mobile receiver.

Hosur teaches a receiver which is one of the following: a fixed receiver, a mobile receiver (**paragraphs 3-5**).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of Hosur in order to provide an orthogonal frequency division multiplexing wireless system with more effective resistance to fading by using two or more transmission antennas and the subcarrier symbols of a burst from one antenna being a transformed version of the subcarrier symbols of the corresponding burst from another antenna (paragraphs 6-7)

With regards to claim 23, Hiroaki in view of the Sipola teaches a receiver according to claim 19. Hiroaki does not explicitly teach a receiver wherein the receiver

comprises means for a return channel via a cellular radio network and/or via a fixed network.

Hosur teaches a receiver wherein the receiver comprises means for a return channel via a cellular radio network and/or via a fixed network (paragraphs 3-5: if the receiver was a mobile receiver, it would be obvious that the return channel would via a cellular radio network and/or a fixed network).

Therefore it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Hiroaki in view of Applicant's Admitted Prior Art with the teachings of Hosur in order to provide an orthogonal frequency division multiplexing wireless system with more effective resistance to fading by using two or more transmission antennas and the subcarrier symbols of a burst from one antenna being a transformed version of the subcarrier symbols of the corresponding burst from another antenna (paragraphs 6-7) .

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Perez whose telephone number is 571-270-3231. The examiner can normally be reached on Monday through Friday: 9am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JP
2/4/2008

SHUWANG LIU
SUPERVISORY PATENT EXAMINER